GARDEN AND FOREST.

PUBLISHED WEEKLY BY

THE GARDEN AND FOREST PUBLISHING CO.

OFFICE: TRIBUNE BUILDING, NEW YORK.

Conducted by . . . . . Professor C. S. SARGENT.

ENTERED AS SECOND-CLASS MATTER AT THE POST OFFICE AT NEW YORK, N. Y.

NEW YORK, WEDNESDAY, AUGUST 1, 1894.

TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLE:—Forestry in the Land-grant Colleges	301
Wayside Plants in the Pines.....*Mrs. Mary Treat.*	302
FOREIGN CORRESPONDENCE:—London Letter.....*W. Watson.*	303
NEW OR LITTLE-KNOWN PLANTS:—Spiræa bracteata. (With figure.).....*C. S. S.*	304
PLANT NOTES	304
CULTURAL DEPARTMENT:—Notes on Trees and Shrubs.....*J. G. Jack.*	306
Climbers for Garden Fences.....*J. N. Gerard.*	306
Alströmerias.....*W. G.*	307
The Hardy Flower-garden.....*F. H. Horsford.*	307
Midsummer Cultural Notes.....*W. H. Taplin.*	308
CORRESPONDENCE:—Orchids in Wellesley.....*A. M. S. Rossiter.*	308
THE FOREST:—Mixed Oak and Beech Forests of the Spessart: Management by the Bavarian Government.—II.....*Sir Dietrich Brandis.*	309
NOTES	310
ILLUSTRATION:—Spiræa bracteata, Fig. 50	305

Forestry in the Land-grant Colleges.

EVERY thinking man knows that this country is already suffering serious loss, and that we are inviting incalculable loss in the future by neglecting to provide any systematic management for our public forests or private woodlands. Not only is there no system, but there is no realization of the fact that we need any system, and the men who control our timber-supply keep on in a happy-go-lucky way, getting the most out of the woods that seems possible to-day, and trusting to luck for to-morrow. No doubt, the country will awake some time, as its needs become pressing, and there will be a demand for skilled foresters, but just where the supply of competent men is to come from is not so clear. To-day it would not be easy to find men who can be trusted to manage a large forest-property to the best advantage; to manage it—that is, in such a way as to secure from it the most remunerative output now, while, at the same time, its productive capacity is not only kept unimpaired, but steadily increasing. Of course, any man of ordinary intelligence and executive force could improve on our present practice, but the men whose knowledge and experience are sufficient to manage our forests to their highest profit as permanent sources of supply are few and far between.

In other countries there are forest experiment stations established by the Government, where investigations are constantly in progress which will add to the knowledge of the various subjects included under the comprehensive term of forestry, and there are schools in which persons are trained in its theory and practice. Even if it were advisable to establish schools of that sort in this country, we have no corps of teachers capable of giving proper instruction, and no well-managed forests to serve as examples. But there is much elementary knowledge which can be acquired without any course in a French or German forest-school, and there seems no reason why the rudiments of the science and art of forestry should not be taught in our agricultural colleges. The state has endowed these institutions, and they are supposed to afford instruction in various departments of agriculture as well as in horticulture, including pomology and even floriculture, and this, too, although the Government does no farming or gardening. On the other hand, the Government does own large tracts of timbered land, many of which are already set apart as reservations, and there is little doubt that other portions of the public lands which are forest-clad will ultimately be left under the control of the General Government, so that, to a certain extent, the Government will manage its own forests. There is a special reason, therefore, why the Government should assume to provide expert training for the care of its own property in this way.

A few of the land-grant colleges recognize the subject of forestry as one of the branches included under the head of agriculture, and it is worth while to inquire how much instruction is actually given at these institutions. Professor C. S. Plumb, of Purdue University, has collected some data from their current publications on this point, which he has kindly placed at our disposal. From these data we learn that not a single reference to forestry is made either in the catalogues, registers or reports of the agricultural colleges in the following states: Alabama, Arizona, Arkansas, California, Delaware, Florida, Georgia, Idaho, Louisiana, Maine, Maryland, Nebraska, New Jersey, Tennessee, Virginia, West Virginia, Wisconsin and Wyoming. In Colorado a portion of one term of the junior year is devoted to this subject. "Lectures are given on gathering and preservation of forest-tree seeds, planting of the seeds, care of seedlings and the value of trees for timber and ornament, for hedges, screens and shelter belts in this state." In Storr's Agricultural School, in Connecticut, forestry is said to be taught with botany and horticulture, but to what extent is not stated. "Some acres of the college-land are covered with a growth of young trees, which will afford an opportunity for the present to illustrate the methods of pruning forest-trees and the management and preservation of forests." In the Illinois University there is a course in forestry which embraces a "study of forest-trees and their uses, natural distribution, and their artificial production." The relations of forest and climate are studied, and the general topic of forestry legislation and economy are discussed. In Purdue University, Indiana, three hours a week, for eleven weeks in the spring of the senior year, are divided between forestry and landscape-gardening. In Iowa Agricultural College, "during the second term of the senior year a general view is taken of the influence of horticulture and forestry on the civilization of the earth and the health and comfort of its inhabitants." Three hours are devoted to this a week. There are "forestry plantations" which are among the means of practical illustration. The Kansas Agricultural College has among its illustrative material "a forest plantation of twelve acres, containing twenty varieties of from one to twenty-five years' growth." In the Kentucky College forestry is included as one subject of instruction under the head of economic botany. In the Massachusetts College instruction is given two hours a week for the fall term and three hours a week for the winter term in senior year. It is added that a large forest-grove is connected with the horticultural department, where methods of pruning trees and the management and preservation of forests can be illustrated. During the spring term of this year, Mr. B. E. Fernow, Chief of the Division of Forestry of the United States Department of Agriculture, delivered a course of twelve lectures before the senior class. In Michigan Agricultural College the seniors may elect to devote their year to the elements of forestry, the first three weeks being given to an examination of the indigenous trees of the neighborhood and the remainder of the term devoted to lectures and reading. There is an arboretum of nearly two acres, which was begun in 1877, and which contains about one hundred and fifty species of trees. In Minnesota, during the first term of the third year, lectures on forestry are given three times a week. There is a post-graduate course in horticulture at the Mississippi College, which includes work in

forestry. In Missouri, lectures are given three times a week during the third year, with required readings on forestry, and it may also be an elective study. In Nevada, forestry is taught by "lectures and the use of the best literature that can be obtained" for five hours a week during the third term of the senior year. In New Hampshire forestry is included under work in botany, and during the winter of 1893 a course of lectures on forestry was given by the members of the New Hampshire Forestry Commission. In the College of New Mexico "instruction is given on the effect of trees on climate, etc." In Cornell University the subjects of arboriculture and forestry occupy two hours a week in the spring term. In North Dakota, in the third term of the sophomore year, five hours a week are given to the subject of forestry for four weeks. The Ohio State University offers a course in horticulture and forestry, and three hours a week are devoted to this subject during one term of the senior year. Instruction in forestry is given in the Pennsylvania State College by lectures, in connection with Hough's *Elements of Forestry*, during one session of the senior year. Two small artificial plantations of trees are maintained on the place, and there is a large experimental tract on an adjacent mountain. Four hours a week are devoted to forestry and landscape-gardening during one term of senior year at the Rhode Island College. In South Dakota there are lectures on the propagation and planting of forest-trees and the study of the habits and characters of the trees best suited to that state. The lecture work is supplemented by practice work in the forest plantation of the college-grounds. The subject is taught two hours a week in one term and three hours in another term of the junior year. In Texas, Hough's *Elements of Forestry* is studied two hours a week during the winter term of the fourth year. In Utah forestry is said to "receive considerable attention." In Vermont instruction is said to be given in forest-planting. This is part of the work on "fruit-culture, landscape-gardening and forestry," which occupies three hours a week during half of junior year.

These details are somewhat tedious, perhaps, but they show pretty clearly to what extent the colleges founded by Government bounty are helping the cause of forestry. It is safe to assume that forestry is not considered of much importance in those institutions whose year-books make no allusion to it whatever. It may be that in the other colleges students receive more instruction than one would infer from the promise in the published curriculum. But where only two or three hours a week are devoted to forestry during one term of a single year, and in institutions where it is considered a branch of landscape-gardening or one of the minor divisions of economic horticulture, we can hardly expect the student to make any remarkable progress. It is encouraging to note that some of the college-farms have forest-plantations, and the subjects of Mr. Fernow's lectures at Amherst College, which we have already published, show that even in a brief course the fundamental problems which confront the pioneers in scientific forestry in America can, at least, be stated, and the methods of attacking them can be outlined. The season for the meeting of various scientific associations is at hand, and the leading instructors in many of these colleges, as well as the officers of the experiment stations, will meet in council. Perhaps it may be worth while for them to inquire in what way, and to what extent, these Government institutions can be made efficient in promoting the cause of forestry.

Wayside Plants in the Pines.

DURING the last few years I have noticed many foreign plants that have become thoroughly naturalized along our waysides in the Pines, where they are making a strenuous, and often victorious, fight for life with our native species. Many of our indigenous plants will not long survive when the woods are cut away and nothing is left to shelter them from the hot sunshine of our dry summers, and when to these trying conditions are added direct attacks of foreign plants, which crowd them and rob their roots of food and moisture, their extermination is more rapid. Among the most showy of these naturalized plants is a Hawkweed, Hieracium aurantiacum, bearing a clustered bunch of deep orange flowers. It is hardy, full of life, and spreads rapidly from seed and runners. Some three years since I took two or three plants from the roadside and planted them in my garden, where they so quickly overran a large area that I was forced to restrain them from becoming dangerous weeds. At the same time I transplanted a few of our own Hawkweeds, among them the slender and delicate H. venosum, but it did not appreciate the kind treatment, although it grows naturally in dry sandy places. Another foreign plant that I have recently observed is a Salvia, which grows in strong, dense clumps, with long branching spikes of quite showy deep blue flowers. The ample radical leaves, ten to twelve inches in length, look fresh and vigorous when other plants are withering in the present drought. It answers to the description of S. verbenacea, with the exception of the leaves, which are never lobed or incised in the least. I think, however, that it is this species.

The Bladder Campion, Silene Cucubalus, is another European plant growing with our native starry Campion, S. stellata, with its large open panicle of pretty fringed flowers. The beautifully veined, inflated calyx of the Bladder Campion is its chief attraction. Galium Mollugo is a handsome plant, growing luxuriantly along grassy roadsides and in fields. It has long panicles of small white flowers, which are fragrant and very abundant, while the stems are thickly set with whorls of small deep green leaves. Our own Galiums will not grow where this aggressive foreign species makes itself perfectly at home. Hall's Japan Honeysuckle, Lonicera Halleana, is another rampant grower in this soil which it is almost impossible to keep within bounds. The seed is carried by birds, so that it has become established in many places along the roadsides and on the edge of woodlands. It has the merit of being a handsome climber. The Lucerne, Medicago sativa, is also taking possession of the roadsides and waste places, but as this is a good forage-plant it will be welcome to farmers and herdsmen. The Ox-eye Daisy is becoming as great a pest here as it is in the older-settled portions of the country; so also is the showy Toadflax, Linaria vulgaris. Were it not for the disagreeable odor of this plant it might be utilized, like the Daisy, in bouquets, but the entire plant is so offensive that it is as little welcome to the flower-gatherer as it is to the farmer. The common Carrot, too, is very abundant on the waysides where it is allowed to grow, but as it is a biennial it can easily be kept in check by mowing before the seed ripens.

The European Clover-Dodder, Cuscuta Epithymum, has recently invaded the Clover-fields here, and threatens disaster to that crop. It is a slender, delicate, parasitic plant which tightly hugs and soon smothers its host, so that the Clover looks as if a fire had passed over it. It blossoms considerably earlier than the native species. The flowers are in small clusters, pure white and quite fragrant, attracting many insects. Like our own Dodders, the plant starts from the ground, but soon dies at the base, and then draws its entire nourishment from its host.

Among our own plants that still cling to the waysides we find many in the Pulse family. One of the most handsome is Tephrosia Virginiana, with large white and pink pea-shaped flowers. Another is the Wild Indigo, Baptisia tinctoria, a round-topped, bushy plant, and when covered with bright yellow blossoms it is quite pretty and showy. The false Indigo, Amorpha fruticosa, also grows on the roadsides, a shrubby plant with dense terminal spikes of small purple flowers. The wild Lupine, too, is very common, with a long showy raceme in varying shades of purple, and there is also a pink variety. The Rose Acacia, Robinia hispida, has also become a roadside shrub, and its handsome deep rose-colored flowers are always wel-

come. The Ground-nut, Apios tuberosa, twines and clambers in masses over the wayside shrubbery wherever the ground is moist. Cassia Chamæcrista, sometimes called the Partridge Pea, and C. nictitans, the wild Sensitive-plant, are both common, as are many other less noticeable plants in this family.

Other families also give us showy hardy plants, as the Butterfly-weed, Asclepias tuberosa, with large umbels of deep orange flowers. But one of the most striking displays in gorgeous yellows that I ever saw was this summer near an old country road. This was a kind of Tickseed, Coreopsis auriculata, and the plants stood so thickly that they had crowded out everything else for a number of rods. They were in full flower, and ran from the road along the edge of the woods which skirted an old deserted field. Examination showed that this was once the site of a garden, as was proved by a gnarled old Apple-tree and a stunted Lilac-bush which still remained. No doubt, the original Coreopsis had been planted here as part of the old-time flower-garden, and had proved its vigor by occupying and possessing this abandoned territory.

The Swamp Rose, Rosa Carolina, is seen everywhere in damp grounds, blooming all summer, as does also the dwarf R. lucida. Many handsome plants in the Heath family may still be seen along the country roadsides—Clethra and the Andromedas and Kalmias.

Vineland, N. J. *Mary Treat.*

Foreign Correspondence.

London Letter.

"Les Orchidées." *—The comprehensive work on Orchids which I stated last year was in preparation by Monsieur Lucien Linden, the managing director of L'Horticulture Internationale, Brussels, is now published, and from what I have been able to see, in a hurried glance through its thousand and odd pages, it is likely to more than fulfill the expectations of those who know Monsieur Linden and his capabilities as a writer upon and cultivator of the great Orchid family. The history of the early collecting exploits of Monsieur Linden, père, the well-known John Linden—who, by the way, is still actively interested in the work of the famous Brussels nursery—is both useful and entertaining, as also are the particulars of the natural conditions under which many of the most important Orchids grow wild. There is plenty of botany as well as history in the book, which consequently contains much instructive matter for those who are only interested in Orchids botanically. Probably, however, its chief value as a contribution to the literature of Orchids is in those parts which deal with the cultural requirements of these plants. On account of the position he has held and the extraordinary success he has achieved as a grower of Orchids, Monsieur Lucien Linden is pre-eminently qualified to speak with authority on their cultivation. The general principles which govern the cultivation of all plants are pretty much the same in all countries, although in matters of detail there is often considerable difference. But every cultivator can find useful information in the chronicles of others, just as he does in observing their methods, and in the details given by Monsieur Linden the most experienced Orchid-grower in other lands than Belgium cannot fail to find valuable hints. The work is well illustrated and printed on good paper, its price being twenty-five francs.

Vanda Roeblinyiana.—This is a new species now flowering in the nurseries of Messrs. H. Low & Co., Clapton, by whom it has been introduced, and who have named it in compliment to the Hon. C. F. Roebling, of New Jersey. It has the habit of V. cœrulea, and bears several slender drooping scapes about nine inches long, each with half a dozen flowers about an inch and a half in diameter; pedicels two inches long, sepals and petals equal, spreading narrow an inch long and colored chocolate-brown, with yellowish lines and spots; lip spathulate, with a long narrow claw, broad at the apex, which is flat, two-lobed, fringed and colored like the petals, paler on the basal lobes. It is distinct from all other species in its long, slender, stalk-like claw and the flat spreading apex of the lip. Although not attractive in color, it is not without interest horticulturally. It was awarded a botanical certificate on Tuesday.

Lælio-Cattleya Timora.—Messrs. J. Veitch & Sons exhibited this week and obtained a first-class certificate for a new hybrid under the above name, which they had raised from Cattleya Luddemanniana crossed with Lælia pumila Dayana. It is a dwarf plant; indeed, it might almost be called an exceptionally vigorous L. pumila, with flowers half as large again of a deeper color, and the large lip of a deep maroon crimson. It is a very handsome and worthy production.

Disa Diores.—This is a hybrid between D. grandiflora and D. Veitchii, also exhibited by its raisers, Messrs. J. Veitch & Sons, and although it did not obtain any special notice, it is likely to come into prominence as a cool-house Orchid; its large flowers are pale in color, with an orange-red tinge on the lower sepals. The plant shown was small and weak and bore only one flower.

Sonerila Mrs. H. Walter.—This hybrid between S. maculata (orientalis of gardens) and S. Hendersoni, a seedling form of S. margaritacea, was shown this week in fine condition by Messrs. F. Sander & Co., and was awarded a certificate for its large richly variegated foliage, in which respect it rivals the Bertolonias. Its leaves are six inches long and four inches wide, dark olive-green, thickly spotted all over with white. Although a common plant in various parts of India, S. maculata does not appear to have ever been in cultivation until it was introduced and distributed by Mr. Bull under the name of S. orientalis. It is a pretty little foliage-plant, and, in addition, is attractive when in flower. It grows to a height of about nine inches and blooms profusely in early winter, the color of the flowers being bright pink. The cross between it and the well-known S. Hendersoni is a very promising plant.

Philadelphus Lemoinei.—If this plant is not grown in American gardens—and I do not see it mentioned in Mr. Jack's interesting notes on cultivated species and varieties of Philadelphus—permit me to give it a strong recommendation as a shrub which is quite hardy at Kew, grows freely and flowers most profusely in June and July. It was raised by Monsieur Lemoine, of Nancy, about six years ago from P. coronarius and P. microphyllus, and it is as attractive and useful a little shrub as one would expect from such a union. We have several beds of it at Kew, and it has flowered almost too freely for its own good this year. P. microphyllus has done well here also, and, in my opinion, is a most delightful little plant for a small bed or group in a sheltered sunny position. It was severely hit by a heavy frost experienced at Kew two years ago.

Rosa gigantea.—Mr. E. D. Sturtevant is to be complimented on being the first to flower this Burmese beauty among the many expert growers who have essayed its cultivation. But there is a hitch somewhere, the smallness of the flowers produced in America being disappointing. We must, however, bear in mind that in Burma this Rose is a gigantic climber, covering large trees with its stout branches; probably, therefore, the undersized flowers borne by Mr. Sturtevant's plant are the aborted product of a weakling in too great a hurry to reveal its flowers. Certainly the dried specimens of this Rose bear out the statement of those who have seen it in the Shan states and describe its flowers as large shallow cups, pure white and six inches across. At Kew the plants grow with great vigor, but they show no signs of flowering, and the same is true of a plant in the garden of Mr. Thomas Hanbury, at Ventemiglia, near Mentone.

Cotinus Cotinus atropurpurea.—This shrub is attractive with us now, the purplish color of its feathery-like flower-heads being much more striking than the type, in which the flower-heads are green. It was distributed several

* *Les Orchidées Exotiques et leur Culture en Europe.*

years ago by Messrs. Lemoine & Sons, Nancy, and is already becoming a favorite shrub in English gardens. There are several groups of it at Kew, and Messrs. J. Veitch & Sons exhibited a nice example of it last Tuesday.

Lilium elegans, var. Horsmani.—There are already many named varieties of the Japanese L. elegans, more commonly known as L. Thunbergianum, and in this distinct form named in compliment to the late Mr. Fred Horsman we have a recent addition. It was shown last Tuesday by Messrs. R. Wallace & Co., Colchester, and obtained a first-class certificate. Its stems are only about a foot high, but the flowers are large and of a deep brown-crimson color, with dark brown spots.

Rubus Japonicus, var. tricolor.—This likely little shrub, which Messrs. J. Veitch & Sons introduced from Japan, obtained a first-class certificate last Tuesday on account of its prettily variegated foliage. The leaves are smaller than in the type, and they are variously colored white, rose or green, or a mixture of all three. Its variegation is likely to render it more delicate than the type, although I learn that it is quite hardy at Combe Wood.

Summer Bedding.—Kew is setting a good example to those who believe in a large use of the Scarlet Geranium and such plants for color-effect in the garden during the summer. The work is simplified by using only one color, one kind of plant, in fact, for each bed, and the effect, in a large garden, at any rate, is more pleasing. The large beds which skirt the principal promenades are filled each with a good Geranium (Pelargonium) or Calceolaria or Heliotrope, and they are a great improvement on the intricate and carpet-rug-like design which used to be worked out with many kinds of plants in the old days. These breadths of brilliant color are, of course, indispensable.

London. *W. Watson.*

New or Little-known Plants.

Spiræa bracteata.

THIS handsome Japanese plant is an addition to our shrubberies of real value. It is a shrub two to three feet high with bright red twigs, ovate to obovate or nearly orbicular leaves, entire below and coarsely serrate with a few teeth above the middle, bright green on the upper surface, paler on the lower, and one-half of an inch to an inch in length. The flowers, which are white and are arranged in rounded corymbs terminal on short leafy branches of the year, are produced in the greatest profusion. The species is easily recognized by the bract, to which it owes its name, and which is borne near the middle of the pedicel of the flower. On the lower pedicels of the inflorescence it is leaf-like and often half an inch long, gradually growing smaller on the upper pedicels, and becoming filiform on the uppermost (see page 305).

In Japan, Spiræa bracteata appears to be confined to the central mountainous regions of the main island. There are specimens in the herbarium of the Arboretum received from the Science College of the Imperial University of Japan collected on Fugi-san, and two years ago I found it at an elevation of 4,000 feet above the level of the sea by the side of the road leading from Nikkô to Lake Ymoto.

Spiræa bracteata was first introduced into English gardens by Von Siebold, and in the catalogue of his plants sold in Leyden in 1882 it appeared, without description, as Spiræa rotundifolia, flore albo. Two years later it was described by Zabel (*Gartenzeitung*, iii., 496) as Spiræa bracteata, the oldest published name. Two years later Maximowicz received the same plant from the Japanese botanists Tanaka and Yatabe, and described it as Spiræa Nipponica (*Mél. Biol.*, xii., 455), a mistake which he rectified on page 934 of the same publication.

Spiræa bracteata was first received at the Arboretum in 1891 from the Experiment Station at Ottawa, and subsequently from the Forest School of Munden, where Dr. Zabel has paid special attention to the cultivation and breeding of the different members of this genus. It is perfectly hardy here, flowering about the middle of June, and has so far proved itself one of the most beautiful and satisfactory plants of its class. *C. S. S.*

Plant Notes.

Rose Madame Georges Bruant.—This valuable Rose was introduced several years ago, but is not yet widely known. It is a hybrid of Rosa rugosa, and resembles its Japanese parent in many respects. The leaves are of a rather light green, and, though handsome, are quite inferior to those of R. rugosa in color as well as in the peculiar crimping of the upper surface. The growth of the hybrid is extremely vigorous, and in a few years it reaches what may, without exaggeration, be called an enormous bush with thick, spiny, erect branches. The flowers are an almost pure white, large, flat and nearly, but not entirely, double. They have a very delicate fragrance and keep well in water. The plant is perfectly hardy in New England, and produces a first crop of flowers in June in great profusion. Not less than two hundred flowers have been picked from a single plant. They are produced during the whole summer in quantity sufficient to supply a household. The Rose is not much attacked by insects, but is in this respect not as fortunate as R. rugosa. All things considered, this hybrid is a really useful and valuable plant. With respect to insects, Dr. Wolcott Gibbs writes that he has used for years with the greatest success a solution made by putting two tablespoonfuls of powdered white hellebore and one of Californian Dalmatian insect-powder into a five-gallon vessel, filling with boiling water, and allowing the whole to stand overnight. The liquid is to be strained through cheese-cloth, and then applied with a rose-syringe to both surfaces of the leaves. Two applications are sufficient for a whole summer.

Rosa polyantha remontant.—We have several times called attention to the useful Roses which were introduced a few years since as R. polyantha remontant. These, it will be remembered, have flowered in ninety days from seed. In their third year these plants continue to be perfectly hardy, and make well-branched bushes some two feet high. These have double and single flowers of various colors, whites and reds. The single pinks are, perhaps, the most effective. They are of the true remontant habit, giving a most abundant show of flowers in the early year, at which time they are of striking beauty in any collection of plants; later they give occasional smaller crops.

Clematis Countess of Onslow.—In the last issue of the *London Journal of Horticulture* is a portrait of this new hybrid, which is interesting because its pollen parent is one of our native species, Clematis coccinea, a Texan plant, which is, nevertheless, hardy as far north as New England. The seed parent of the new plant is Star of India, one of the garden forms resembling in form the well-known C. Jackmanni, and one of the section which bears great numbers of flowers on the shoots of the current year. The flowers of C. coccinea are solitary, shaped like a bell, although constricted near the mouth. They are an inch long, with thick leathery perianth divisions strongly reflexed at the extremities. The flowers of the hybrid show their descent from C. coccinea in being somewhat trumpet-shaped, with a broad opening. In color they are bright purple, with a scarlet band down the centre of each petal. Since C. coccinea begins to flower in June and continues without interruption until frost, it would be interesting to know how this constantly blooming habit affects the new plant. Most of the large-flowered garden hybrids have proved very unsatisfactory of late years, being subject to a mysterious disease which carries them off without warning, so that they are not planted to so great an extent as they formerly were. We have so many good species, however, such as C. vitalba, C. crispa, C. flammula, C. graveolens, C. paniculata, C. Virginiana and many

more, that they are not greatly missed in outdoor cultivation. The flowers of these species are all so distinct that they offer great inducements to experimenters in hybridization.

CEPHALANTHUS OCCIDENTALIS.—The Button Bush is a native shrub which is found throughout the entire width of the continent and in eastern Asia, too, in marshy places, or often where its roots are constantly under water. When planted, however, on dry ground, like many other plants that are naturally found in wet places, it seems to thrive almost or quite as well. No one, when gathering a wild bouquet, would pass it by without taking some of its sprays, for its pointed leaves are clean and bright, and its perfectly spherical heads of white and fragrant flowers, from which the slender styles stand out like rays in every direction, poise gracefully at the ends of the branchlets. Nevertheless, for some reason this has never been classed among ornamental shrubs. We have been so accustomed to see it running wild, perhaps, that it may seem out of place in cultivated grounds, but it certainly would look at home on low ground, and especially on the margins of pools or brooks in company with Dwarf Willows and Alders. It makes a stout shrub eight or ten feet high, and the fragrant flowers, which are much sought for by bees, remain open for a long time.

KŒLREUTERIA PANICULATA.—This tree has a decided value for ornamental planting because it flowers in midsummer after most other trees are out of bloom. It begins to flower as the blossoms of our native Chestnuts are fading, and its upright panicles of bladdery fruit are already making it conspicuous in another way. It is a perfectly hardy tree, but for some reason single limbs occasionally die back to the trunk in a hard winter. So far as our observation goes, this disaster has always come upon trees planted in very rich ground. Still, this may not be the cause. The spreading branches of the tree and its large compound dark green leaves make it interesting during the entire season. There is considerable variation in the color of its flowers, which are borne in large panicles, the best of them being a rich yellow. The fruit also varies in color, some of it being a bright green, others tinged with dull red, and others still a deep purplish bronze. The tree comes from northern China, but the seeds readily germinate where they fall on the ground in this country, so that it is becoming naturalized in some places.

Fig. 50.—Spiræa bracteata.—See page 304.

ODONTOGLOSSUM CRISPUM MIRABILE.—This plant, which originated in the famous collection of Baron Schrœder, and was certificated by the Royal Horticultural Society something more than a month ago, is, without doubt, a natural hybrid between O. crispum and O. Lindleyanum. According to the *Orchid Review*, the shape of the lip and crest, as well as of the wings of the column and arrangement of the blotches, all show unmistakably the influence of O. Lindleyanum and the characters of O. crispum. The flower is three inches across, the petals of an ivory-white color when first opening, and afterward of a pure white, while

the blotches are of cinnamon-brown. About two-thirds of each sepal are occupied by what seems to be two or three large blotches which have run together, and the petals have one large blotch above the middle and two or three small ones near the margin below.

Cultural Department.

Notes on Trees and Shrubs.

SOME correspondence has recently appeared in two or three of the Boston newspapers regarding the Woad Waxen, Dyer's Broom, or Genista tinctoria, as it is known botanically. This plant is an introduction from Europe, and probably it is not to be found growing so naturally and abundantly anywhere in the United States as in the region about Salem, Massachusetts, although it is also said to have become naturalized in eastern New York, and may be found in other isolated patches.

The newspaper correspondents have expressed the fear that the plant is likely to become a most troublesome weed if it is too freely planted in new localities, and the suggestion has been made that its spread should be checked. There may be cause for this apprehension, although, when compared with some obnoxious weeds, this plant seems slow in disseminating itself. Considering that it is more than two centuries and a half since Governor John Endicott was popularly credited with having introduced it into the colony at Salem, the area now covered seems relatively small. As proof that the plant has been long established we read in Dr. Jacob Bigelow's *Plants of Boston and its Environs*, published in 1815, that "this plant has overrun the hills on the south side of Salem, so as to give them in the month of July an uniformly yellow appearance at a distance." Genista tinctoria is also mentioned by earlier writers. At the end of June and in the early part of July, when the Woad Wax is in full bloom, some of the Essex County hills present a most beautiful sight with their covering of rich yellow color. Here the plant has taken almost complete possession of the ground, few other flowering plants ever gaining and holding a place with it. It is not easy to eradicate the Woad Wax when once it gets firmly established in the soil, especially where it is so rocky as the region of its present home. Few animals care to eat it while other vegetation is to be obtained, so it generally remains comparatively unmolested in the pastures.

The means of natural distribution of the plant seem to be few. It may throw its small, hard and heavy seeds several feet by the sudden opening of the ripe pods, the seeds may be washed along hill-sides by heavy rains, or they may be carried considerable distances by browsing animals, by rodents, or possibly by birds, and be left in places where they can germinate and grow. It spreads also by the roots, so that a single individual may ultimately cover a good-sized piece of ground. The plant is likely to be found in abundance in other parts of the country before many years have passed. The popular admiration for its blossoms and an erroneous idea that it is free from disfiguring diseases have caused the Woad Wax to be distributed largely both in the form of plants and seed. It has been planted in parks, cemeteries and private grounds in different states. In such new localities it would be well to watch it and guard against its spreading where undesirable.

It has been suggested that the state undertake the extermination of the weed, but such an unwise course is not likely to be seriously considered. The state's experience in the case of the gypsy moth has convinced many persons of the folly of special legislation of this nature and under such conditions, and some of those foremost in advocating the work are now glad to be rid of responsibility for it.

One writer, after referring to the danger of allowing the Genista tinctoria to spread and add one more to our list of imported weeds, mentions the Sweet-brier Rose as an example of a most troublesome pest in this state. There must be some mistake about this, however, for the Sweet-brier is by no means abundant, even in neglected pastures and fields. Probably some or all of our common native Roses are included in the general condemnation. And in this part of the country Roses of any kind are easily enough destroyed if there is any desire to do so. In some parts of Australia, however, where the Sweet-brier Rose has been introduced from Europe, it is said to have become a serious pest, the climatic conditions enabling it to propagate rapidly and grow luxuriantly. The name of pest might be urged against many other foreign shrubs or trees by those opposed to the naturalization of foreign importations which are not directly useful. The common Barberry, Berberis vulgaris, is an example. This is more abundant here than the Sweet-brier Rose and delights in similar situations. Some of our states have passed laws against the existence of this Barberry because it was found to be the host plant of a certain fungus which, in another stage, affected wheat.

The common Privet, Ligustrum vulgare, has been regarded as a nuisance under some circumstances; the Buckthorn, Rhamnus catharticus, has been found fault with because it occasionally escapes from cultivation and crowds other natural shrubbery; and there are people who would banish the Chinese Ailanthus, or Tree of Heaven, because of the disagreeable odor of the flowers and its free, reckless habit of throwing up suckers.

Arnold Arboretum. *J. G. Jack.*

Climbers for Garden Fences.

THERE is one thing in which we suburban gardeners usually fail to make the most of our opportunities. We have generally many yards of fences, which at best are not ornamental, serving only to give a more contracted, formal look to our small gardens. We usually are content to leave these mostly bare, and we seldom plant our gardens so that these enclosures will be thoroughly well covered and obliterated as structures. Yet there is a wealth of material available for such purposes, and this is not only mostly beautiful in itself, but while draping the fences with foliage enlivened with bright flowers, they also serve two especially useful purposes. In the first place, the special boundaries are thereby made less prominent, and the gardens are thus practically enlarged. And they play a still more important part in making effective backgrounds for the borders. The importance of beautiful backgrounds cannot be too strongly urged, and I fear we usually give them too little study. We grow many plants with much care, often to be disappointed, simply because, while they may be handsome in themselves, there is no foil against which their beauties are thrown. A garden in which impressions are only secured from a view overhead, is, of course, not as effective as one where the same material produces pictures from all points of view.

It is not much trouble to cover the fences with annual vines, many of which have a marvelous capacity of growth. It is sufficient to mention the Ipomœas, of which there is a great variety, the Gourds, Japanese Hops, Cobæas, etc. But these must be replaced each season, besides which there is a wealth of material, mostly hardy, which is rather more effective, and which will increase in beauty from season to season. Roses must not be omitted, of course, and some of the original species are especially effective, though the foliage will require some care to keep it in good condition during the season. Garden and Forest has given full descriptions of all these Roses. The thriftiest is Rosa multiflora, with myriads of small white single flowers, borne on graceful sprays. A plant of this Rose will quickly cover a large space. Mr. Dawson's hybrid of this species, the Dawson Rose, produces strong long shoots filled with clusters of exquisite pink flowers, small and double. Probably the new Rose, Crimson Rambler, will prove a darker flower with the same habit. Later, Rosa setigera will delight any grower who can enjoy an informal mass of simple flowers. The climbing Hermosa is a valuable plant in this latitude, and it will be well with such plants as this to heighten the fence with a trellis. The Gloire de Dijon is the most prolific of the running Roses, but needs a little protection here, or the stems will be ruined, though it is perfectly hardy at the root. Old-fashioned gardens used to have strong-growing Cabbage or China Roses, which were very effective; but these seem to have disappeared, crowded out by the newer strains, of which few seem to have the climbing habit.

The variegated Grape (Vitis heterophylla) is one of the cleanest and most effective low-growing vines of perfect hardiness. At present it is thick with foliage borne on graceful sprays, this being daintily variegated, and not offensively so, as is too often the case with such plants. Later it will be furnished with an abundance of violet-colored berries.

The Clematis family furnishes many varieties for a pleasing selection, all beautiful, and some with very thrifty habit of growth. Personally I prefer the small white-flowered kinds, like C. flammula and C. paniculata. The former sweet-scented variety has just finished giving a wealth of its delicate sprays. A similar species with smaller leaves is just succeeding it, while C. paniculata will carry the effect forward to September. C. crispa and C. coccinea are curious and interesting climbers, with larger closed flowers. The latter plant seems to have been crossed recently with a large-flowering species, produc-

ing a new break. The larger-flowered Clematises are effective plants when they do well, but, with the exception of C. Jackmannii, they are usually short-lived, even with skillful culture. As generally grown they do not cover space very well, and it is not a bad plan to grow them near some more thickly furnished climber. I had a plant of Lady Bovill growing and flourishing through a variegated Grape-vine, and the combination was very good. The Clematis foliage has been much eaten this year by the large black beetle which usually appears with the Asters in August.

The hardy Peas, especially Lathyrus latifolius, are useful for fence-covers, as they will quite overtop it. Of these I fancy the white-flowering ones, though those of a light pink color are also pleasing. The type is an ugly purplish-red. I have had named varieties of the type, Turneri being now in flower, and this just escaped being a good color. There are a number of species of hardy Peas which it would be well to try, as L. Drummondii, Sibthorpi, Gorgonus, rotundifolius and tuberosus, though I have not been able to establish them, excepting only the latter. Then there are several California kinds, as Splendens and Sulphureus, which might be hardy south of New York.

We have two very good hardy climbers in Apios tuberosa and the Adlumia. The latter is especially delicate, and would be very handsome if it did not flower, but its quickly fading flowers speedily ruin its effectiveness. While not hardy, there is no climber more handsome than Allamanda Hendersonii, which may be flowered successfully here in the open. It will have to be prepared in the greenhouse by starting a good dormant plant in bountiful root-room in fertile soil. It may be transferred out-of-doors in June, and in not too much sunlight it will flower as strongly as under cover. It might be well to try some other greenhouse climbers in the open, the Passifloras, Bougainvilleas and Aristolochias, for instance. However, the really hardy plants will furnish abundant materials for most of our gardens, and there is little danger that we shall all produce uniform effects.

Elizabeth, N. J. *J. N. Gerard.*

Alströmerias.

THE hardiness of these fine plants has been very much underrated. In my garden, seeds of Alströmeria aurantiaca and A. aurea, scattered by the bursting of the seed-vessels upon the surface of the ground in August, take root and grow vigorously the next spring. In this way the neighborhood of a large bed always exhibits a number of small plants which grow like weeds, but which do not bloom until the second year. The bed itself has now become a dense mass of plants, and must be dug over in September, so that the tubers may be again planted at proper distances. The young plants go through the winter without injury, though, in spite of the relative mildness of the climate, the thermometer not seldom falls to ten degrees, Fahrenheit, in the course of the winter. Large plants require no covering to protect them from cold, but, unless the root is in very well drained soil, the tubers are apt to rot. I cover my large bed with a board frame in November after the plants have died down, simply to protect the roots from winter rains, yet one or two large plants have done very well without this protection. The soil here is a light loam upon a bed of clay three or four feet below the surface. A top-dressing of stable-manure in the fall is a decided advantage. Vilmorin, in the *Fleurs de Pleine Terre*, says that even in the climate of Paris the tubers should be buried from twenty to thirty, and even from forty to fifty centimeters (from eight to twenty inches) beneath the surface. Now, not only here at Newport, but even in the much more severe climate of Cambridge, Massachusetts, no such precautions are necessary. In a very fine private garden at Cambridge I have seen large clumps of A. aurantiaca and A. aurea which have stood out for years without any protection whatever, but it is to be noted that the soil is a rather coarse sand with a bed of clay many feet beneath the surface. What I have said applies also to A. Chilensis and its various forms, but probably not to the other species.

As it is difficult to import the tubers from Europe on account of their brittleness, it is much better to get good seed, if possible. And this brings me to another point: Most of the seed which I have imported came from a well-known German firm in Italy, and I believe that the seeds sold in England and France come from the same source. It cannot be obtained, so far as my experience goes, until the late autumn months at best, and frequently not until the spring. A very small proportion of this seed will germinate, even if sown in a frame as soon as received and protected during the winter, or if sown in a greenhouse. Whether this is due to the fact that the seed is not fresh, or that keeping only a few months after it is ripe injures its germinating power, I am unable to determine. There is always a great difficulty in obtaining from Europe seed very recently gathered. As all gardeners know, a year is lost when seeds of many species of Primula and other fine plants are not sown until the spring after they are collected. Has not the time arrived when seed-growing should be undertaken with us? The same remarks apply to many fine bulbs for summer planting and autumn blooming. I refer, for instance, to all the Autumn Crocuses, Colchicum, Nerines and Sternbergia lutea. These should be replanted as soon as possible after the ripening or decay of the foliage. But it is practically impossible to import the bulbs in July or August. I have usually received them in September at the earliest, and the bloom for the first year is then worthless. In fact, such bulbs require several years to recuperate. Would it not pay the California bulb-growers to cultivate the bulbs which I have named?

Newport, R. I. *W. G.*

The Hardy Flower-garden.

AFTER repeated trials, Calochortus Weedii, a rare and beautiful species from southern California, has at last bloomed here. The plant is a little less than a foot high, bearing three to five large bright yellow flowers, three inches wide. The bulbs were planted in a frame last autumn and covered with a good depth of leaves. It is one of the last of the Californian species to bloom, coming into flower before the Mexican Calochorti.

Tigridia Dugesii (Watson), a Mexican plant, is now in bloom. It resembles T. violacea in height, time of flowering and the size of its flowers; but the flowers are a very pale blue, almost white in fact, with a brown and yellow centre. Nemastylis flava, an Iridaceous plant from Mexico and quite new, is now showing bright yellow flowers about the same size as those of Trigridia Dugesii. The flowers of this genus are generally blue.

Bessera elegans, now in bloom, has done remarkably well with me this year for the first time. It insists upon having perfect drainage. Indeed, it demands more than this; it requires a dry, sandy situation, and would, no doubt, succeed on the hottest portions of the rockery where the soil is two or three inches deep.

Erodium macradenium, a plant of the Geranium family, is a low-growing hardy perennial from the Pyrenees. Its height is about six inches, and the pale violet flowers are about half an inch wide. The two broader petals are dark purple at their base. It has been in bloom almost every day since the first of June.

Gentiana pneumonantha, the Wind Flower, has flowered well with me. It will grow in drier soil than most species of this genus. Its deep blue terminal and axillary flowers are about an inch in length by half an inch through. It is a native of Europe and attains a height of about eight inches.

Centaurea Ruthenica is a Russian species three feet high, with good-sized heads of pale yellow flowers. Its foliage is rich, and, altogether, I consider it a much more attractive species than the C. dealbata, from the Caucasus, which attains a height of about eighteen inches, with more numerous, but smaller, rose-colored flowers. Both species are quite hardy.

Veronica spicata, which blooms about the middle of July, has good-sized spikes of light blue flowers three to seven inches long. The plant is about two feet high, hardy, and in every way desirable for the mixed border.

Lepachys pinnata, a tall western plant, closely allied to Rudbeckia, the Cone-flower, comes into bloom about the last of July. Its drooping bright yellow rays are quite pretty, and it is effective for massing. Rudbeckia speciosa is somewhat similar to the Lepachys, but is taller, with orange-yellow flowers three inches across. The yellow petals contrast finely with the dark purple disk.

Silene Shafta, a Prussian species, opens its purple flowers about the last of July. They are quite small, but numerous, and make the little plant, when at its best, really pretty. Dianthus glaucus blooms after most of the hardy Pinks are past, and I think this advantage worth noting. Its flowers are fragrant, about an inch wide, and of a light pink color.

The little Welsh Poppy, Meconopsis Cambrica, blooms from seed about the 20th of July. The flower is a peculiar shade of reddish yellow about two inches wide. The plant attains a height of about ten inches. It is a perennial, but did not survive the winter here, though well protected. Perhaps this protection was what killed it. However, it does finely treated

as an annual, and is one of the most attractive little species I have seen.

Several of the Sea Pinks (Armeria) do finely here. A. plantaginea is about two feet high, with pale pink flowers in round heads and on long naked stems. A. montana has bright pink and very handsome flowers, which remain at their best for a long time.

Charlotte, Vt. *F. H. Horsford.*

Midsummer Cultural Notes.

THIS is a time of particularly active growth among foliage-plants under glass, and close attention to watering, syringing and ventilation should therefore be observed. Healthy Palms will absorb almost unlimited quantities of water at this time if proper drainage has been supplied to the pots, and during bright weather will enjoy being syringed twice a day. At the afternoon syringing it is a good practice to close the ventilators for an hour or so, even though the house becomes quite warm, as this will encourage growth by checking too rapid evaporation from the foliage; and after this vapor-bath has been continued from one to two hours, ventilators should be opened and air given all night.

Various fine-foliaged plants, like Sphærogynes, Dieffenbachias, Dracænas and Marantas, will now be growing fast, and will require abundant moisture and shading to color well. If exhibition specimens are desired the plants must not be permitted to become badly root-bound, for such plants are gross feeders, and the lower leaves are sure to suffer when the roots are not acting. The Alocasias, too, enjoy liberal treatment, though usually in a much more open compost than is required for the plants just named. Heliconia aurea striata and Phrynium variegatum are both quite easy subjects to grow, and very effective for conservatories, though the Phrynium will endure the most exposure without injury.

Nepenthes will now be growing very freely either in pans or baskets; the latter method displays the curious pitchers to the best advantage. In repotting Nepenthes it should be remembered that their roots are very tender and brittle, though wiry in appearance, and a decided check will be given if the roots are disturbed to any great extent. A mixture of coarse peat and sphagnum-moss makes a satisfactory compost for them, and free applications of water are needed both at the root and overhead.

Old plants of Dracænas that have become leggy and unsightly can now be topped by making an incision just below the leaves and then binding up the wound with moss, which must be kept continually moist to induce the formation of roots. The same process may be employed in the case of Ficus, Pandanus and various other plants at this season when root-action is so vigorous.

Ferns and Selaginellas will also require abundant watering at the root, and in some instances overhead, but it is safest to err by omission in the matter of syringing Ferns, for the majority of them will thrive equally well without having their foliage sprinkled, and to some it is a positive injury.

Many cool-house plants, like Indian Azaleas, Camellias, Genistas, Acacias, Ericas and Gardenias, will be summering outdoors, and the main cultural point to be observed with these plants is not to allow them to suffer from drought. Thorough syringing every day with a strong pressure of water is the best way to keep them healthy and free from insects. The Azaleas should have full exposure to sunlight in order to insure well-ripened growth and abundant flowers the following season, but the pots should be plunged to protect the tender rootlets from excessive heat.

Holmesburg, Pa. *W. H. Taplin.*

Correspondence.

Orchids in Wellesley.

To the Editor of Garden and Forest:

Sir,—One of the best collections of Orchids in Massachusetts is that of Mr. H. H. Hunnewell, at Wellesley. It numbers about 4,000 plants, and it has required the labor of years to make it so large and complete.

Among the Odontoglossums, O. Alexandræ, on account of its variability, is considered the most useful and it is one of the most beautiful of Orchids. Its flowers range in color from pure white to yellow and rose, including spotted forms, some with a tinge of brown. It is a great favorite of Mr. Hunnewell's, judging from the many fine plants seen of this species, and among the many fairy-like sprays of it I noticed at a recent visit no two were alike. O. vexillarium is another valuable species, on account of the distinct color and large size of its flowers. There are many varieties of this charming species, and one of them, Album, is grown here in quantity. Its lovely white flowers have only the faintest tinge of rose toward the lower portions of the sepals and petals. Rubellum is a variety smaller than the type, but with colors intensely brilliant, in which rose, magenta-rose and crimson-purple predominate. Many fine plants of O. Pescatorea may be seen, although now out of bloom.

Odontoglossum Hunnewellianum is a natural hybrid, which was discovered in Bogota in 1888, and introduced by Messrs. Sander & Co. Its flowers, borne on racemes, are waxy-white, thickly spotted with brown, the petals tipped with yellow, and no two plants produce blooms exactly alike.

Oncidium macranthum, with flower-spikes several feet tall, finely branched and carrying a wealth of orange and brown flowers, was growing here in perfection. Here too, were good plants of the robust O. phymatochilum, with its long spikes of curious and fragrant flowers, which remain open two months. Fine plants of O. serratum will soon open their large chocolate-brown and yellow-margined flowers, borne on their long twining scapes.

Among the Cattleyas, a magnificent specimen of C. Gaskelliana was carrying 160 very large flowers. Very strong and vigorous are the plants of C. virginalis, whose beautiful flowers, with snowy white sepals and petals, are delightfully fragrant. In the Gigas section, C. imperialis, with flowers ranging from lavender to deep magenta, and some of them ten inches in diameter, was very conspicuous. C. Sanderiana was in the richness of its foliage and in the size and color of its flowers equal to the best forms of C. gigas. Several plants of the new C. Victoriæ reginæ will soon follow these in bloom, as they are now showing strong flower-spikes set closely with buds, while the many robust-growing varieties of C. labiata will not flower before November. There is a peculiar airiness and grace about the flowers of this Labiata section, and their fringed wings give them a light and soaring character, which, together with the marked variety of form and color which they display, justifies the admiration they command. Of course, there are numberless plants of C. Trianæ, and especially of the nearly white flowering varieties, and they are all showing strong flower-sheaths. Here were C. Mendelii, with its white and delicate mauve flowers, and the collection is rich in plants of C. Lawrenceana, which is becoming somewhat rare. I noted a magnificent plant of C. Skinneri, which had recently been a beautiful sight with its rosy-purple blossoms, as well as C. Warneri, C. superba, C. Wallacii, C. Wagnerii, C. Reinechiana and other varieties of Mossiæ, all in splendid condition.

The robust Cypripedium grande, a garden hybrid, was the most striking specimen of this genus in flower. The extended pouch and ribbon-like petals, a foot or more in length, pale yellow staminode, flushed with crimson and fringed with a darker shade of the same color, altogether make an attractive picture. Other Cypripediums in bloom were C. Curtisii, C. Harrisianum and C. barbatum Warneri, C. superba and C. concolor, all worthy of notice and fine specimen plants.

Dendrobium Dearii, with its white blossoms, nearly three inches across, and produced on racemes ten or a dozen of them together, seem to float in the air like butterflies, and last several weeks in perfection. The golden yellow and fragrant flowers of D. suavissimum are produced freely in arching racemes, and also remain for a long time in full beauty. D. clavatum is notable for rich trusses of rich orange-yellow flowers, and D. Wardianum, an early bloomer, shows many strong and beautiful spikes. D. crassinode is a distinct and beautiful species which ought to be seen in June, when it produces its beautiful flowers, waxy white, tipped with magenta-purple, and showing a white velvety lip with an orange blotch at the base.

Many magnificent specimens of Lælia purpurata are here collected. L. amanda, soon coming into bloom, is a distinct plant with flowers five or six inches across of a flesh-color, with a rich purple venation. Plants of L. anceps are already beginning to show their spikes, as do the white varieties. Of the curious Masdevallias, the best species here are M. Davisii, with beautiful orange-yellow flowers, and many varieties of M. Harryana, which is one of the handsomest and most distinct species of the genus. Grammatophyllum Elwesii, Thunia Bensoinæ, different Ærides, with their long racemes of fragrant purple flowers, and many other rare plants of this family are found, not only in the three large houses devoted entirely to them, but in many other nooks and corners where their beauty is most effectively displayed. Mr. Hunnewell throws open these treaures of his glass houses, as well as the

beauties of his extensive grounds, to the general public, and large numbers of visitors avail themselves of this privilege.

Wellesley, Mass. *A. M. S. Rossiter.*

The Forest.

Mixed Oak and Beech Forests of the Spessart: Management by the Bavarian Government.—II.

LENGTH OF ROTATION FIXED FOR OAK AND BEECH.

THE woods here described are all what is called "high forest," that is, the trees are raised from seed, either self-sown or planted, naturally or artificially. In order to explain a term which has been used already, "the period of rotation," it will be convenient to say a word regarding coppice woods, consisting mainly of stool-shoots or root-suckers, which are periodically cut over. The object of coppice woods is the production of hop-poles, vine-props, withies for basket-work, fire-wood, bark used for tanning and the like. For this purpose the coppice is cut over at a certain age, one or two years old in the case of Osier beds, fourteen to twenty years in the case of Oak coppice, where tanning bark is the principal produce, and so on. An area of Oak coppice, managed on a rotation of, say, fifteen years, is divided into fifteen subdivisions or compartments; compartment 1 being cut this year, compartment 2 the next, and so on. After the fifteenth year, when compartment 15 has been cut, the coppice shoots on compartment 1 have attained the age of fifteen years, and when this has been cut over the second time it may be said that the second rotation has commenced. High forests are also divided into compartments, but the number of these compartments has no relation to the length of rotation. Cuttings of the mixture timber in one compartment are generally continued during a number of years, and in most cases cuttings go on in several compartments at the same time. Oak stools one hundred years of age and older may still, on being cut over, bring forth vigorous coppice shoots, and if the operation is carefully performed Oak stools may last during six or more rotations. In the case of high forest it is different; here the term of rotation means the time which elapses from the seedling until the mature crop is finally cut down.

Generally it may be said that in the Spessart it is most advantageous to let the Oak attain an age of 300 years, and hence 300 years has been fixed as the period of rotation for this species. It does not, however, follow that no Oak-trees will be cut before or after they have attained that age. As already explained, many of the trees now standing in the Spessart are much older; in fact, the greater portion of the yield expected during the first period will consist of much older trees. Some of them show signs of deterioration, as indicated by their getting dry branches or becoming stag-headed. Such trees are always removed first, sound and vigorous trees being left as long as possible, or until the compartment in which they stand is taken in hand for regeneration.

It is quite different with the Beech, of which, as previously explained, the greater part can only be sold as fuel, for charcoal burning, or for the manufacture of wood alcohol and other products of the dry distillation of the wood. No object would be gained in allowing the Beech to attain a great age. Hence, for Beech, the term of rotation has been fixed at 5 x 24=120 years. A mature wood in its normal condition would, therefore, in the Spessart, consist of Oaks 300 years old, mixed with Beech 120 years of age. In other words, when the Beech in any compartment is cut, a proportion of the Oak-trees would be held over until the second cutting of the Beech took place. It does not, however, follow that a proportion of well-grown Beech-trees might not be held over so as to attain a greater age than 120 years, for there is a demand for large Beech-timber, though that demand is at present limited.

In the numerous valleys which begin in the Spessart range, and which run in all directions toward the Main River, large saw-mills have been established, where timber of these forests is cut up. These establishments do not, however, alone depend upon the Spessart timber. They import from Slavonia and other parts of Germany large quantities of Oak, Ash and Elm. The Spessart Oak has given the start, but the business has developed and the produce of the Spessart is no longer sufficient to meet the increasing demand. Cheap railway freights and the low price of timber in these remote forest districts have brought about this development of the lumber industry in the vicinity of the Spessart. The working-plan, sketched above, provides for a fairly even supply of large Oak-timber from the Spessart during the next ninety years. This certainty of a sustained supply during so long a period is a great advantage for the establishments alluded to, as well as for the lumber trade generally in this portion of Germany. During the interruption in the supply of the Spessart Oak, which will take place at the close of this period, use will be made of the produce of forests in other parts of Germany, which are stocked with Oak-trees of the requisite age.

RECLAMATION OF THE DEVASTATED FOREST-AREAS.

The second point to which the attention of the Bavarian Government was specially directed, was the reclamation of the devastated forest-areas which had become impoverished by reckless clearances and by the uncontrolled wholesale removal of litter. The northern portion, situated north of the great railway line Aschaffenburg-Lohr-Wurzburg, had suffered most, because here the villages are larger and more numerous. Naturally, places with shallow soil, such as the tops of ridges and localities with the rock close to the surface, have become impoverished to a greater extent by the removal of litter than places with deep soil. On these devastated and partially denuded areas it was hopeless to attempt to raise Oak and Beech; conifers were the only trees from which success could reasonably be expected. The first experiments were made with Scotch Pine, later on Spruce also was resorted to, particularly on low ground. In 1820 1.7 per cent of the total area was stocked with conifers; in 1876 the area had been increased to 35 per cent., and it is still larger at present. Most of these coniferous woods are on the outskirts and in the northern half of the Spessart, and this explains that the traveler who passes through this portion of the Aschaffenburg-Lohr railway line sees more Scotch Pine and Spruce woods from the train than Oak and Beech. These kinds have a much more rapid rate of growth than Oak and Beech, hence the term of rotation for Scotch Pine has been fixed at 4 x 24 =96, and for Spruce at 3 x 24=72 years. Although the timber of these trees commands much lower prices than Oak, these devastated and impoverished areas, nearly all of which have now been planted up in this manner, will shortly begin to yield a good return.

It is noteworthy that in this large forest district, besides the Juniper (Juniperus communic), no coniferous tree is indigenous. Higher up the Main River, above the town of Kitzingen, indigenous forests of the Scotch Pine occupy large portions of the valley, and east of the river, between Kitzingen and Bamberg, the hilly tract known as the Steiger Wald, is stocked with a mixed forest of Beech, Scotch Pine and Oak. Nor are the Spruce, the Larch and the Silver Fir indigenous in the Spessart. Groups of Larch and Spruce were planted here and there during the last half of the eighteenth century, and fine specimens of these species, 120 years old and upward, are found here and there. The good condition of these old trees has induced the Bavarian forest authorities not to limit the planting of these trees to devastated and impoverished land, but to contemplate the creation of mixed woods of Beech and these conifers. This will be more fully explained further on.

Bonn, Germany. *Dietrich Brandis.*

Notes.

A tract of Cypress swamp-land containing 30,000 acres, and lying adjacent to Lake Maurapas, in Louisiana, and reported to contain three hundred million feet of choice timber, has been

lately sold to a Chicago capitalist. This is said to be the largest sale of Cypress timber-land on record.

The foliage of Narcissus Trumpet major, from the Pyrenees, did not complete the ripening of its foliage until after the middle of July, while other varieties in the same position have long since gone to rest, and probably the Poeticus varieties have begun to move and start new roots. Such facts show the necessity of discrimination and lifting and planting the bulbs of different varieties.

The large sales of melons in this market would seem to indicate that the southern growers of this crop were having a successful season. But the farmers of Georgia say that the late frost killed the entire early crop, while the second crop has been shortened by the drought and the closing of the western markets by the railway blockade has brought additional hardship, so that few growers will make their expenses.

A meeting of the botanical societies of France and Switzerland is being held in Geneva this week. To the programme of the meeting, our correspondent, Dr. Christ, President of the Botanical Society of Switzerland, adds a most interesting and instructive account of the botanical features of those parts of the Valais which the members of the societies expect to visit in the numerous excursions from Geneva which have been planned for their instruction and amusement.

The railway troubles which checked the shipment of California fruit to eastern markets has led to a heavy increase in the amount of dried apricots, which will reach a grand total of 12,000 tons. Eastern buyers are now offering no more than seven cents a pound for this fruit, but California dealers are asking ten cents. The disposal of this large quantity of dried apricots, nearly double the product of any previous season, will be helped by the scarcity of the prune crop.

During the past year or two experiments have been made in various ways by German officers with peanut flour and dried and roasted peanut grits as food for soldiers as well as for horses in the German army, but, although no symptoms of injury to health resulted from the use of these articles, they were not adopted as a part of the army ration. The troops showed an unconquerable dislike to food prepared from peanut flour or grits, and its frequent use is not considered healthful or nourishing. An investigation of the merits of peanut-food articles was also made in the imperial navy, and their value as a diet for invalids was tested, but their use was not sanctioned.

A Municipal Art Society, modeled after the one in this city, has been organized in Boston. Its object is "to increase the beauty of the metropolitan district of Boston by the gift and erection of works of art in public places, and by promoting public action having in view the better aspect of the city." Its executive committee consists of nineteen members—a president, two vice-presidents, a secretary, treasurer and counsel, the Mayor of Boston, and twelve others, three of whom must be architects, three painters, three sculptors and three laymen. It would seem as though at least one professed landscape-gardener might well have been included in the list.

Experiments during three years have been carried on at the New York State Experiment Station by Mr. D. G. Fairchild to compare the efficacy of different fungicides against the leaf-blight, so destructive of nursery stock of Plums and Cherries. Windsor, Yellow Spanish and Montmorency Cherries on Mahaleb stock, and the same variety on Mazzard stock, were treated, and in every case where the Bordeaux mixture was used the leaf-blight was prevented to a notable degree. The same was true of Plums on Myrobolan and Marianna stock. The sprayed trees held their leaves a month later than the unsprayed. The tops and roots weighed more, and the stem was larger.

A memorial has just been presented to Congress by Senator Squire, of Washington, praying for the establishment of a National Park on the Pacific coast, which shall include Mount Rainier. The memorial, which is signed by many eminent men of science, speaks of the singular grandeur of the mountain scenery which it is desirable to protect from defacement, and makes a special appeal for the preservation of the rare colony of Arctic animals, as well as the Arctic plants, which inhabit the flanks of the mountain, where they are completely isolated from their kind. Other objects of interest are the eight large glaciers, besides the magnificent forests on the slopes of the mountain and at its base, where the trees attain a size and beauty rarely seen outside of the Puget Sound region.

The Summer School of Science for the Atlantic provinces of Canada closed its eighth session on the 19th of July. The meetings, which were this year held in Charlottetown, Prince Edward Island, had a membership of almost a hundred students, many being teachers from remote points, who were refreshed by a vacation in a delightful climate, and amid scenery of quiet beauty, while enjoying excellent opportunities for instruction in the natural sciences. Especial attention was given to botany. This department was directed by Professor G. U. Hay, editor of *The Educational Review*, Mrs. W. W. Andrews and Miss Antoinette Forbes. The meeting next year will be held at Wolfville, in the Annapolis Valley, which is the centre of the fruit-growing region of Nova Scotia and the seat of the Government School of Horticulture.

Monsieur Laverune, in an article on bread, published in *Cosmos*, gives some interesting information on this form of food which is so universal in enlightened countries that the word is used as a synonym for all food. In early historic time men were not familiar with the preparation of wheaten flour which we call bread, and in our own day there are entire populations wholly ignorant of its use. In the vast empire of China, for example, containing a quarter of the human race, bread, as we understand the term, is used in one province only. The bread-eaters are still a minority in the world. No more than five hundred millions of persons habitually consume wheaten bread. Even in Europe, great numbers of the people who eat bread are reduced to use an inferior article made of coarse cereals and pulses and indifferently prepared. In fact, the world is moving but slowly toward the realization of the familiar prayer of Christendom, "Give us this day our daily bread."

Most cut flowers look better when associated with their own foliage than with any other surrounding, and carnations do not make an exception to the rule. In writing on this subject, Mr. Albert M. Herr suggests to commercial growers in *The American Florist* that in order to obtain the requisite amount of foliage to accompany a given number of flowers some plants should be grown for their leaves alone. The foliage could be grown in cheap houses without much heat, and the extra price received for a dozen long-stemmed flowers, together with a dozen or so sprays of good foliage, would pay for the trouble and be more satisfactory to the buyer. A bunch of carnations is handsomer when some buds are included with the flowers, but not so many of these are needed when enough foliage is used. Varieties differ much in the form and color of their leaves, and certain kinds might be selected with reference solely to the value of their foliage for cutting. There seems to be nothing visionary in this suggestion, and we hope to see carnation-foliage a merchantable commodity as well as carnation-flowers.

Only eight car-loads of California fruits were sold in this city during last week, and these were the earliest arrivals after the railroad blockade. But on Monday of the present week seventeen car-loads were sold at auction, and the market is once more full. Last week peaches commanded the extreme wholesale price of $5.55 a box, and the same peaches are now selling at $1.50, while Tragedy prunes, Washington plums and Bartlett pears are quite as cheap. Crawford's Early is, perhaps, the most plentiful among California peaches now here, and of other seasonable varieties St. John, which originated in Louisiana, is among the best; it is even earlier than Crawford's Early, though somewhat smaller; the flesh is juicy and rich in flavor, while its orange-yellow and deep red color makes it very attractive. Decker, Foster, Strawberry and Red Free are other varieties which are here in quantity. Nearly a dozen varieties may be seen in any large assortment of plums, including Purple Duane, Columbia, Washington, Peach, Kelsey, Ogon, Bradshaw, Quackenbos and Royal Hative. Buerre Clairgeau and Clapp's Favorite pears are quite abundant, and large Princess Anne cherries of a most delicious quality are now so plentiful that they may be bought as low as eighty-five cents for a ten-pound box. A few late Moorpark apricots and the first new white nectarines came in this week with early white Astrachan apples from the Sacramento valley. The California fruit season in the east is thus fairly open again, and it is gratifying to know that the losses of fruit-growers on the Pacific coast will not be as serious as has been feared, because the fruits there are ripening at least two weeks later than their usual time. Choice Niagara and Delaware grapes, from North Carolina, are now twenty-five cents a pound, and hot-house White Muscats and Black Hamburgs, from Long Island, cost $1.25 and $1.50. A few Alligator pears in the markets are sold for $2.00 to $3 00 a dozen, and many more could be handled, since salads made of them are rapidly growing in favor among epicures. Evaporated California peaches, as well as cherries and blackberries of this year's crop, are already on sale.